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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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01/31/2005

BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314

EXAMINER

DANG, PHUC T

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/627,609	OU ET AL.	
	Examiner	Art Unit	
	PHUC T DANG	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-9,11-16,18-20 and 22-26 is/are rejected.
- 7) ☒ Claim(s) 6,10,17,21,27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on July 28, 2003 is acceptable.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The drawings of Figures 4A-4B are objected to as failing to comply with 37CFR 1.84(p)(5) because they do not include the following reference sign(s) "442 inner wall". Correction is required.

Specification

4. The specification is objected to because of the following:

On page 6, line 1, the term "... metal layers 430a and 430b..." should change to -- ... metal layers 450a and 450b... --.

Claim Objections

5. Claims 1-12 are objected to because of the following informalities:

In claim 1, line 2, the term "... a plurality of conductive traces layers ..." should change to -- a plurality of conductive trace layers --.

In claim 1, lines 5-6, the term "... corresponding conductive traces layer ..." should change to -- corresponding conductive trace layer --.

Claim Rejections - 35 USC § 102

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-5, 7-9, and 11-12 are rejected under 35 U.S.C. 102 (e) as being anticipated by Lubert et al., hereinafter "Lubert" (U.S. Patent No. 6,618,940 B2).

Regarding claim 1, Lubert discloses a circuit substrate, comprising:

a board having a plurality of conductive trace layers (29, Fig. 9) and insulating layers (15 and 17, Fig. 9), and a via (5, Fig. 9) formed in the board;

a plurality of metal layers (29, Fig. 9) formed on an inner wall (9, Fig. 9) of the via, wherein each of the metal layers (29, Fig. 9) electrically connects to the corresponding conductive trace layer (29, Fig. 9) respectively; and

an insulator (11, Fig. 9) formed in the via (5, Fig. 9) to electrically isolate from each of the metal layers (29, Fig. 9).

Regarding claim 2, Lubert discloses further comprising a plurality of via lands (39, Fig. 11) disposed on the board and at the periphery of the via (5, Fig. 11).

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Regarding claim 3, Lubert discloses wherein each of the via lands (39, Fig. 11) is disposed correspondingly to each of the metal layers (29, Fig. 11).

Regarding claim 4, Lubert discloses wherein the insulator (11, Fig. 11) is positioned between the metal layers (29, Fig. 11).

Regarding claim 5, Lubert discloses wherein the via is a through hole (5, Fig. 2).

Regarding claim 7, Lubert discloses wherein the via is a blind via [col. 3, lines 20-27].

Regarding claim 8, Lubert discloses wherein the material of the metal layers is copper [col. 5, lines 25-27].

Regarding claim 9, Lubert discloses the material of the insulator is epoxy [col. 7, lines 16-22].

Regarding claim 11, Lubert discloses wherein the board comprises a plurality of insulating layers and conductive trace layers, and the insulating layers are interlaced with the conductive traces layers [Fig. 11].

Regarding claim 12, Lubert discloses wherein the via land is made of copper [col. 5, lines 25-27].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 13-16, 18-20, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubert et al., hereinafter, "Lubert" (U.S. Patent No. 6,618,940 B2).

Regarding claim 13, Lubert discloses a fabrication method of a circuit substrate, comprising:

providing a board;

forming a via (5, Fig. 2) in the board;

forming a metal layer (29, Fig. 9) on an inner wall (9, Fig. 9) of the via;

Lubert discloses all the features of the claimed invention as discussed above, but does not disclose a step of cutting the via to form a cutting street to separate the metal layer into a plurality of separated metal layers; and filling an insulator in the via and the cutting street.

However, Lubert discloses a step of etching to separate the metal layers as shown on col. 7, lines 10+. Then, a step of etching is used in Lubert's reference is similar to a step of cutting the via to form a cutting street to separate the metal layers and filling an insulator in the via and the cutting street of the claimed invention discussed above.

Thus, it would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the teaching of Lubert discussed above such that a step of cutting the via to form a cutting street to separate the metal layer into a plurality of separated metal layers; and filling an insulator in the via and the cutting street for a purpose of protecting the metal layers.

Regarding claim 14, Lubert discloses further comprising forming a via land (39, Fig. 11) on the board and at the periphery of the via (5, Fig. 11).

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Regarding claim 15, Lubert discloses wherein cutting the via further separates the via land into a plurality of separated via lands [Figs 9 and 11].

Regarding claim 16, Lubert discloses wherein the via is a through hole (5, Fig. 2).

Regarding claim 18, Lubert discloses wherein the via is a blind via [col. 3, lines 20-27].

Regarding 19, Lubert discloses wherein the material of the metal layers is copper [col. 5, lines 25-27].

Regarding claim 20, Lubert discloses the material of the insulator is epoxy [col. 7, lines 16-22].

Regarding claim 22, Lubert discloses wherein the board comprises a plurality of insulating layers and conductive traces layers, and the insulating layers are interlaced with the conductive trace layers [Fig. 11].

Regarding claims 23-14, Lubert discloses wherein forming the metal layer (29, Fig. 11) on the inner wall (9, Fig. 11) of the via comprises forming an activated film which comprises a conductive polymer on the inner wall of the via by electro-less plating; and forming a metal film on the activated film by plating [Figs. 9-11 and col. 2, lines 17-56].

Regarding claims 25-26, Lubert discloses wherein cutting the via comprises mechanical drilling and laser ablation [col. 6, lines 17-23].

Allowable Subject Matter

8. The following is a statement of reason for the indication of allowable subject matter:

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Claims 6, 10, 17, 21, and 27-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the Prior Art made of records does not disclose the via is a buried via as cited in claims 6 and 17 and the material of the insulator is ink as cited in claim 10 and 21 and wherein cutting the via comprises photochemical reaction as cited in claim 27 and plasma etching as cited in claim 28.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and After Final communications.

11. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

PD



Primary Examiner

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